SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

REPORT
ON
PROPOSED CHANNEL IMPROVEMENTS
ON
RANDOL CREEK

ZONE C-1 PROJECT NUMBER 30029

DECEMBER, 1968

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CENTRAL ZONE FLOOD CONTROL ADVISORY COMMITTEE

H. H. Hyde
R. L. Warnick
J. H. Sullivan
A. R. Turturici
C. R. Kinney, Jr.
S. Chinchen

Donald K. Currlin
General Manager

This report was prepared under the direction of
Lloyd C. Fowler, Director of Engineering

By

William M. Roman	Planning Division Engineer
John L. Richardson	Flood Control Section Engineer
William Carlsen	Associate Hydraulic Engineer

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FLOOD CONTROL AND WATER DISTRICT
DONALD K. CURRLIN GENERAL MANAGER

516 EAST MARTHA STREET
SAN JOSE, CALIF. 95112
DEPARTMENT OF ADMINISTRATION AND FINANCE 299-2031
CLERK OF THE BOARD 299-2031
ENGINEERING DEPT. 299-3841
PUBLIC SERVICE DEPT. 299-3841

November 12, 1968

Board of Directors
Santa Clara County Flood Control
and Water District
516 East Martha Street
San Jose, California

Gentlemen:

Transmitted herewith is the Engineer's Report on Proposed Channel Improvements for Randol Creek, Project Number 30029, in Zone C-1 (Central) of the Santa Clara County Flood Control and Water District.

The report describes 8,140 feet of proposed channel improvements consisting of earth channel sections, rock lined channel, culverts, drop structures, and reinforced concrete box sections. The proposed improvements will minimize flood damage to the existing and projected urban development in the flood plain of Randol Creek.

The estimated cost of the proposed 8,140 feet of channel improvements is $500,000. About 2,700 feet of the channel improvements have been constructed in conjunction with the development of a subdivision in the City of San Jose. The cost of this construction would be reimbursable under the terms of an agreement between the developer and the District.

I concur in the project as proposed and recommend that a public hearing on this proposed channel improvement be held as a prerequisite to the construction of the project.

Sincerely yours,

Donald K Currlin

General Manager

INTRODUCTION

Randol Creek is in the Central Zone of the Santa Clara County Flood Control and Water District. It originates in the Los Capitancillos Mountains south of the Almaden Valley. The upper reaches of the watershed contain some old quicksilver mines one of which was the Randol Tunnel.

Although Randol Creek has a relatively small drainage area of about two square miles it has a high flood potential. The rapidly urbanizing area of the Almaden Valley within the flood plain of Randol Creek has required the realignment and improvement of about 2700 feet of the creek northerly of Almaden Road. This work was done by a development agency in conjunction with work on a subdivision. This work was reviewed and recommended by the Central Zone Flood Control Advisory Committee and approved by the District. The agreement provided that the developer would finance and construct the required minimum flood control improvements and the District would repay the developer subject to a successful public hearing and availability of funds.

This Engineer's Report on the Proposed Channel Improvements on Randol Creek is a prerequisite to a Public Hearing on the project and the repayment of the advanced construction funds. The report presents the results of a number of studies of the various construction alternatives that were analyzed. The report consists of:

1. A general description of the watershed and the flood problems with a map showing the location of the proposed project.
2. A discussion of the proposed project together with maps showing plans, profiles, typical cross sections and rights-of-way.
3. An estimate of the cost of the proposed project and suggested means for financing these costs.

DESCRIPTION OF WATERSHED

Randol Creek watershed is shown on Plate 2 which is a general map of the area. The creek originates in the hills southerly of the main Almaden Valley and northerly of the town of New Almaden at about elevation 1700. It flows northerly from the hills across the Almaden Valley to a confluence with Alamitos Creek, a distance of about 3 miles. The watershed area is 2.2 square miles and has an average annual precipitation of about 28 inches.

At the present time (1968) the watershed in the hills is unincorporated territory and the downstream flood plain area is primarily in the City of San Jose. Most of the downstream gently sloping areas are presently in subdivisions or proposed subdivisions.

The soils on the steepest portion of the watershed in the hills consist primarily of stony soils, in the less steep hills the soil is of a clay loam type, and in the gently sloping areas of the remainder of the watershed the soil is of a gravelly loam type. The soils in the steeper areas have a relatively low permeability and are developed on sandstone-shale bedrock with consequent high rate of run-off.

The native growth in the hills is a fairly heavy cover of grass, low growing brush, and trees. This type of vegetation has a considerable effect on reducing run-off for low rainfall intensities but has little effect on the higher intensity rainfall which produces the design flows.

In computing the flood flows for the design of the creek improvement these characteristic factors of the watershed and the existing urban development of the entire watershed were considered.

DESIGN CRITERIA

The criteria used in the design of the Randol Creek flood control improvements followed accepted engineering standards. The hydraulic design of the channel considered the 80 percent upper confidence limit on design discharge in setting freeboard requirements. Conservative values of roughness (representing the friction along the channel banks and bottom) were used in the hydraulic design to allow for some deterioration in channel smoothness with time. Economic evaluations of alternative channel designs were based on estimates of construction, including engineering and inspection costs, right-of-way values, and the present worth of future maintenance costs.

The level of protection provided by the completed improvements was set by the District standard so that the project is designed to safely convey a one percent flood (the so-called 100-year recurrence frequency flood) to a point of disposal. The design flood flows meeting this standard for Randol Creek were computed using run-off coefficients suitable to the characteristic of the watershed considering the potential urbanization. The resulting computed design flows are given in Table 1 which follows.

TABLE 1

Design Flood Flows

Reach	Station	Location	Watershed Area(2) Acres	Peak Flows Design(3) CFS	Peak Flows Upper Limit(4) CFS
Part of 2 and 3, 4	32+00 to 81+00	Freitas Cr.(1) to end project	1102	620	900
1 and part of 2	0-40 to 32+00	Alamitos Cr. to Freitas Cr.	1429	680	1000

(1) The design can convey the additional flow from a possible diversion of Freitas Creek into the Randol Creek channel at a location upstream of the present confluence.
(2) At lower location on reach.
(3) For 100-year recurrence frequency.
(4) At 80 percent confidence limit for 100-year recurrence interval (used in establishing freeboard requirements).

may be conveyed in local storm drain pipelines. As such construction progresses it is recommended that debris basins be constructed in upstream reaches of major tributaries.

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WATER DISTRICT
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CONSTRUCTION STAGING

The flood control improvement project on Randol Creek divides easily into three construction stages. Stage 1 includes the existing channel improvements which have been installed with funds advanced by a subdivision developer.

Stage 2 would consist of the drop inlet to the Bret Harte culvert and the rock lining and realignment necessary to improve the creek up to Rajkovich Way. This work would best be done at the same time the Bret Harte Drive culvert is constructed.

Stage 3 would consist of the remainder of the project and would best be accomplished in conjunction with urbanization of the watershed.

PROJECT COSTS AND FINANCING

Estimates of the cost of construction of the proposed flood control facility improvement to Randol Creek were made using 1968 prices. A contingency item was estimated to account for the costs of engineering, construction inspection, advertising, legal fees, and other incidentals. The estimated costs are presented in Table 2.

TABLE 2

Estimated Costs of Project

Reach No.	Stage No.	Station Limits	Construction	Engineering & Contingencies	Total
1 (part)	1	0-40 to 27+00	$ 53,000	$ 13,000	$ 66,000*
1 (part)-3	2	27+00 to 44+12	47,000	12,000	59,000
4	3	44+12 to 81+00	146,000	37,000	183,000
Total Constr., Engr., & Cont.			$246,000	$ 62,000	$308,000
Right-of-way, Reach 3					25,000
Right-of-way, Reach 4					167,000
Total Project Costs					$500,000

*Actual costs of completed improvements amount to $52,553.50 and will be reimbursed to the Land Development Corporation who advanced the construction funds.

The current assessed valuation of the Central Zone will provide an adequate source of funds from ad valorem taxes to finance the project by stages as proposed herein. These construction costs do not include the debris basins which may be required in the upstream reaches at a later date.

CONCLUSIONS AND RECOMMENDATIONS

As a result of the investigation of Randol Creek reported herein it is concluded that:

1. The unimproved channel of Randol Creek is inadequate to prevent flooding and damage to urban development now occurring in the flood plain of the creek.

2. The unimproved channel gradients are steep and are causing excessive erosion and consequent downstream silt deposition in the flood plain area.

3. Increasing development of the watershed will increase the flood damage potential both by increasing run-off and by placing additional urban development in the path of flood waters.

4. The most economical solution to the flood control problem would be to construct 7,500 feet of earth channel, and 640 feet of reinforced concrete boxes.

5. The estimated construction cost including contingencies and rights-of-way to be financed from District funds is $500,000. Debris basins may be required and should be installed when needed.

6. By appropriate staging of construction and reimbursement of advanced funds the project can be completed within the existing tax rate of the Central Zone.

Based on these conclusions it is recommended that the flood control improvements on Randol Creek as proposed herein be approved and construction initiated to complete the remaining reaches of the project.

Submitted:

John L. Richardson

John L. Richardson
Senior Hydraulic Engineer

Recommended Approval:

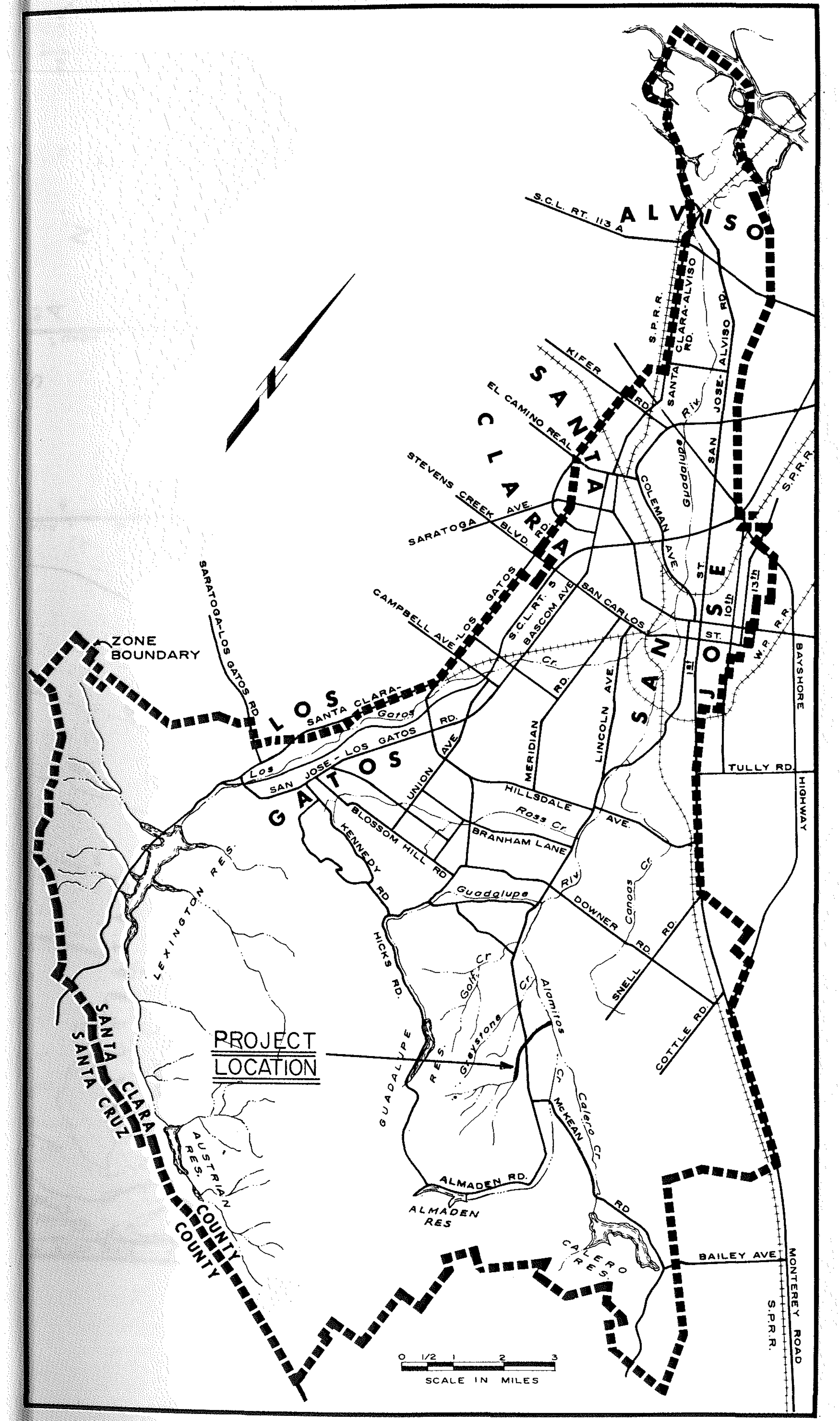
William M. Roman

William M. Roman
Planning Division Engineer

Approved:

Lloyd C Fowler

Lloyd C. Fowler
Director of Engineering



MAP AND GENERAL PLAN

FOR

RANDOL CREEK

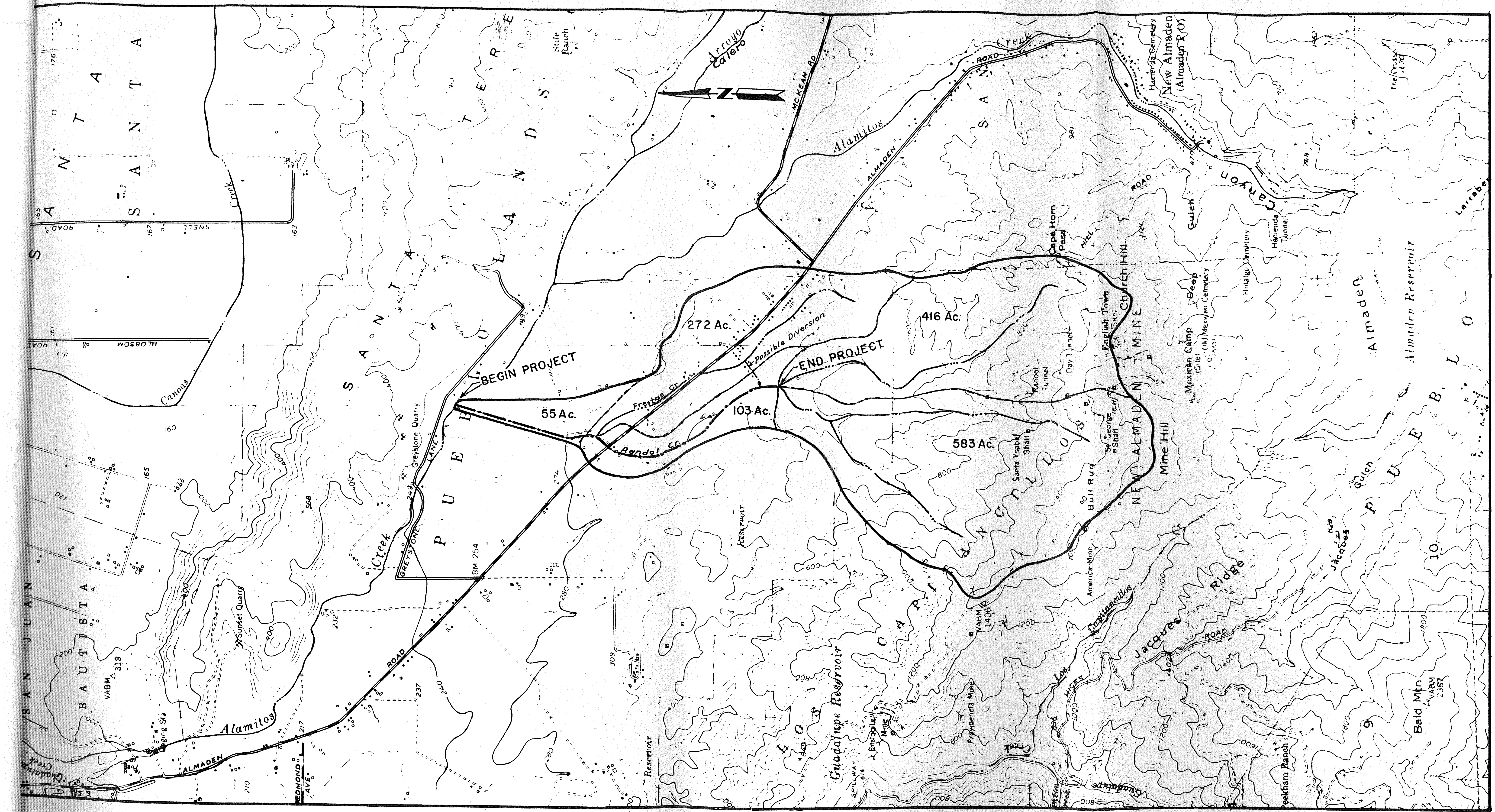
IN THE CITY OF SAN JOSE, CALIFORNIA

SANTA CLARA COUNTY FLOOD CONTROL AND WATER DISTRICT

CENTRAL FLOOD CONTROL ZONE - PROJECT NO. 30029

Project Approval:
Donald K Currlin
General Manager
Date: November 12, 1968

PLATE I



LEGEND

Project Route

Main Watershed Boundary

Intermediate Watershed Boundary

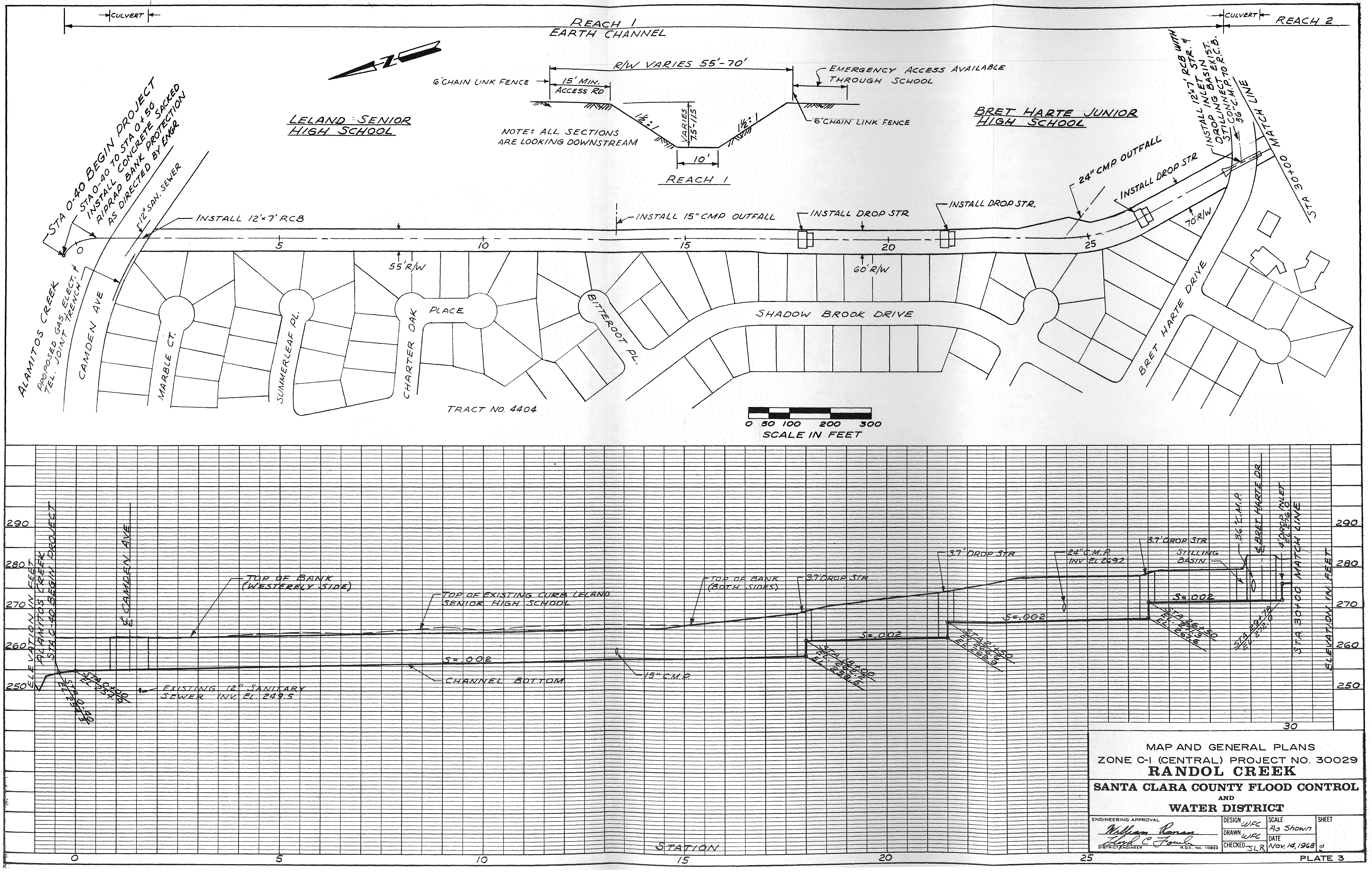
SCALE IN FEET
0 1000 2000 3000

RANDOL CREEK WATERSHED

PROJECT NO 30029

TOTAL AREA 1429 Ac

PLATE 2

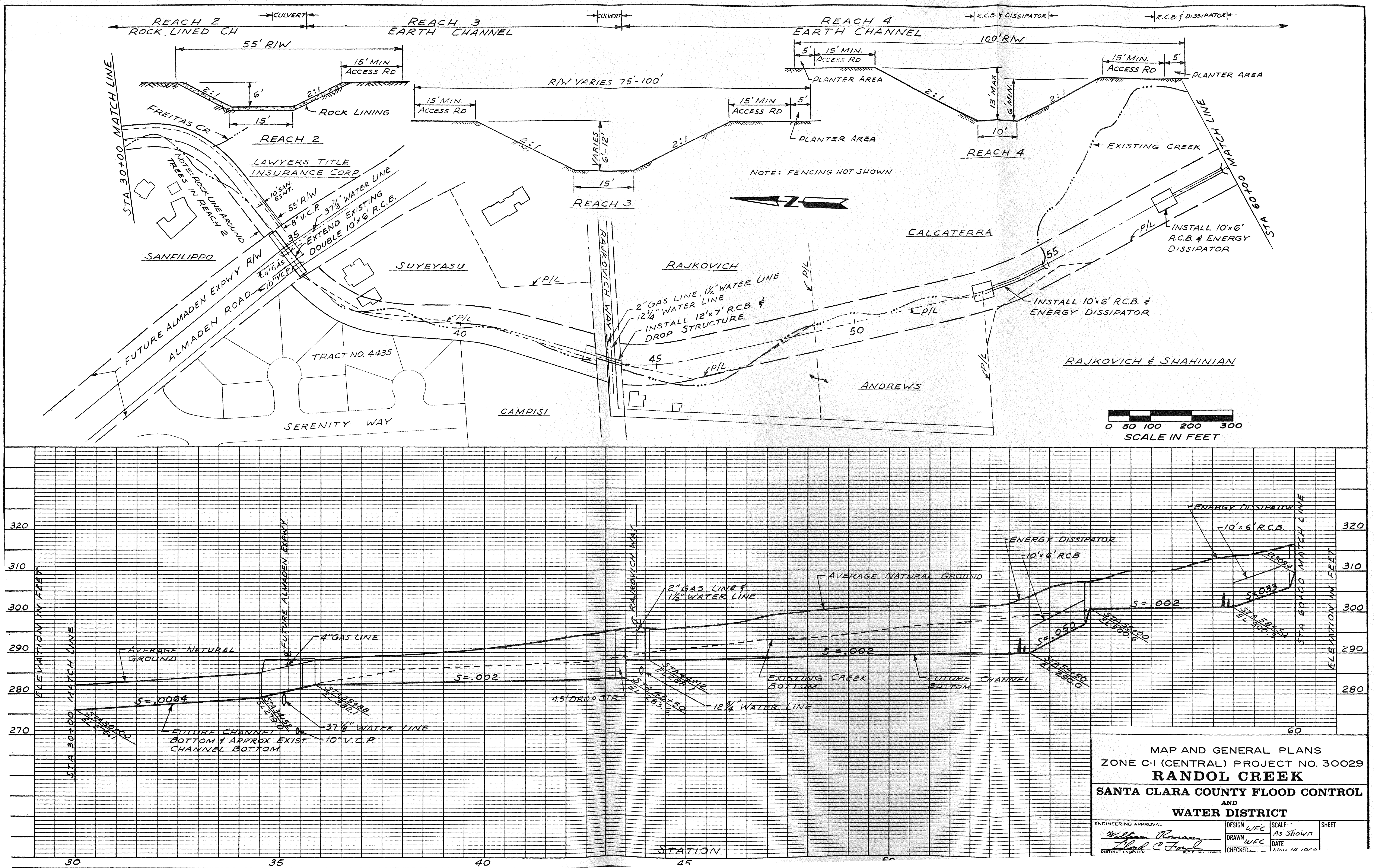


MAP AND GENERAL PLANS
ZONE C-1 (CENTRAL) PROJECT NO. 30029
RANDOL CREEK

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

ENGINEERING APPROVAL	DESIGN WFC	SCALE As Shown	SHEET
William Ramsey Lloyd C Fowler DISTRICT ENGINEER R.C.E. No. 10822	DRAWN WFC CHECKED JLR	DATE Nov. 14, 1968	of

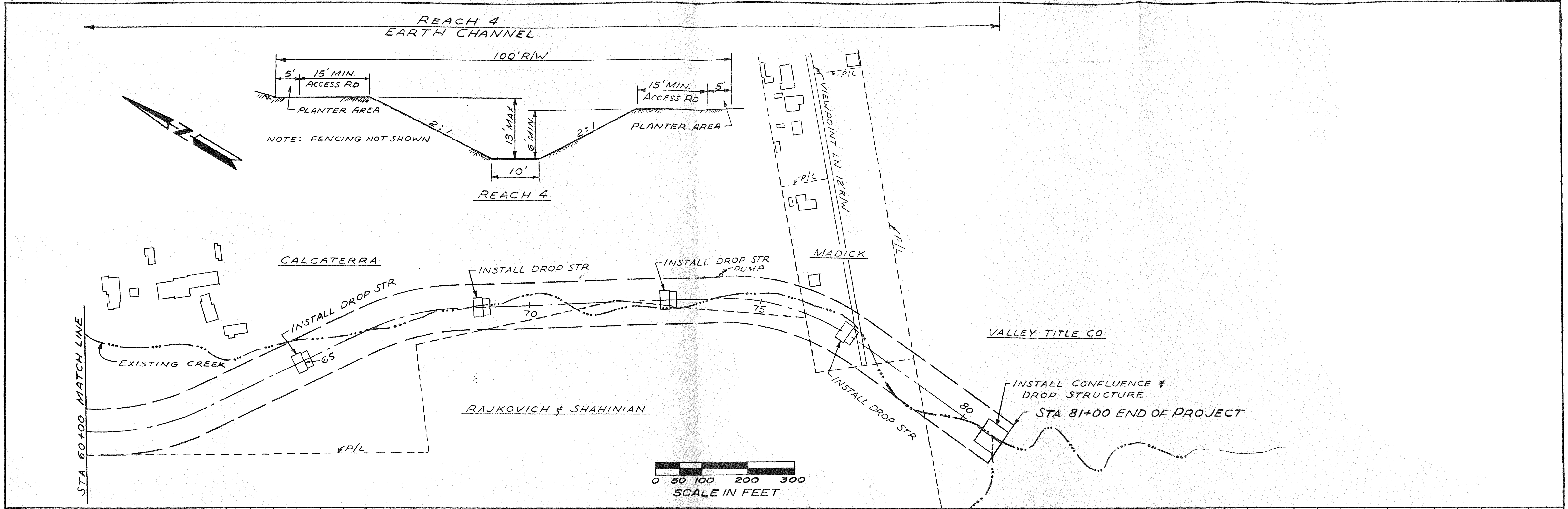
PLATE 3

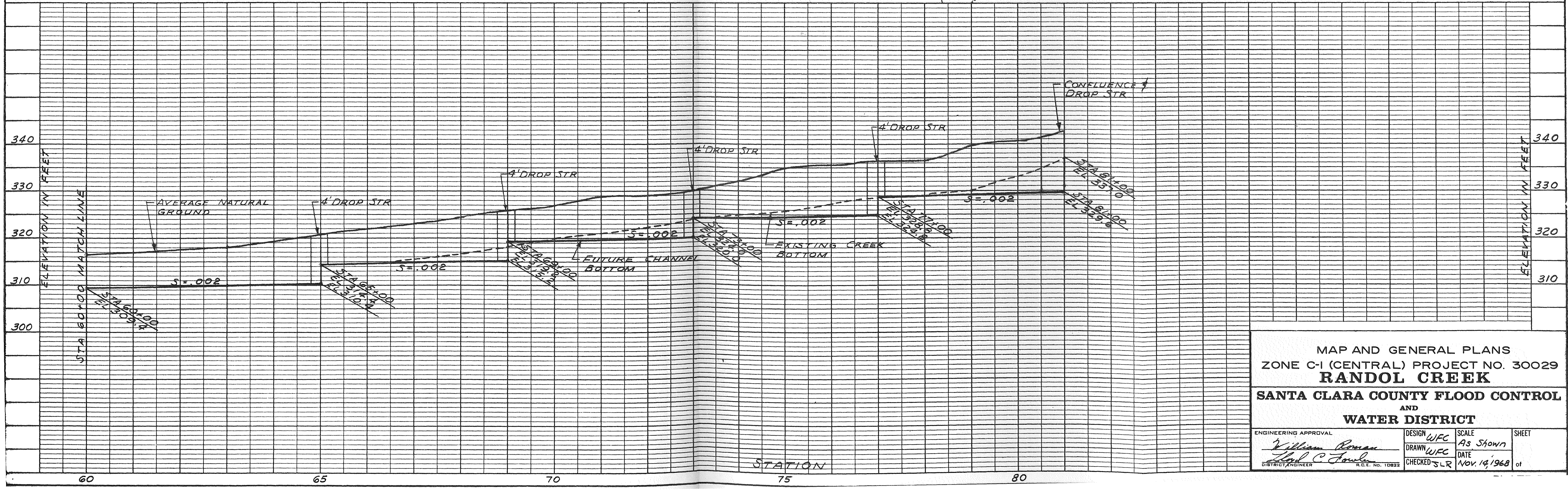


MAP AND GENERAL PLANS
ZONE C-1 (CENTRAL) PROJECT NO. 30029
RANDOL CREEK

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

ENGINEERING APPROVAL	DESIGN WFC	SCALE As Shown	SHEET
William Roman Lloyd C Fowler DISTRICT ENGINEER R.C.E. No. 10	DRAWN WFC CHECKED	DATE Nov 14 196	





MAP AND GENERAL PLANS

ZONE C-I (CENTRAL) PROJECT NO. 30029

RANDOL CREEK

SANTA CLARA COUNTY FLOOD CONTROL
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ENGINEERING APPROVAL			
William Roman Lloyd C. Fowler DISTRICT ENGINEER R.C.E. No. 10822	DESIGN WFC	SCALE As Shown	SHEET
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